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Soybean Digest



per 22ND ANNUAL CONVENTION
SEPTEMBER, 15-16-17, 1942
LAFAYETTE, INDIANA

Official Publication

OF

THE AMERICAN SOYBEAN ASSOCIATION

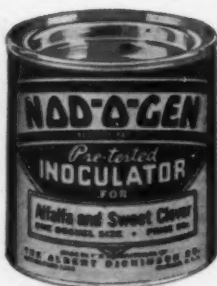
VOLUME 2 • NUMBER 10



AUGUST • 1942

A GOOD RECORD

You are invited to check how NOD-O-GEN stands in State and Federal inspection of commercial cultures for legumes. You will find NOD-O-GEN stands near the top in almost every report. Besides, the fact that sales of NOD-O-GEN have increased steadily for many years is evidence of its satisfactory field performance.



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NOD-O-GEN
The Pre-tested Inoculator

THE *Soybean Digest*

Vol. 2

AUGUST ☆ 1942

No. 10

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Published on the 15th of each month at Hudson, Iowa, by the American Soybean Association. Entered as second class matter November 20, 1940, at the postoffice at Hudson, Iowa, under the Act of March 3, 1879. Forms close on 10th of month. Subscription price to association members, \$1.00 per year; to non-members, \$1.50 per year.

WOODSON-TENENT LABORATORIES

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Official Chemists for National Soybean Processors Association

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Get in Touch With Our Processing Plants

St. Louis, Mo.

Circleville, Ohio

Lafayette, Indiana

Iowa Falls, Iowa

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MARKET SUMMARY

SOYBEANS

	Aug. 8	July 24	July 9
October	1.72 1/4	1.74 1/2	1.76 1/4
December	1.73 3/4	1.75 3/4	1.77 7/8

SOYBEAN OIL

	Aug. 1	July 24	July 9
Tanks, Midwest Mills.....	11 1/4-1/2	11 1/4-1/2	11 1/8-1/4

SOYBEAN MEAL

	Aug. 7	July 24	July 8
October	35.75	36.25	36.00
December	35.00	35.00	35.75
	sales	@36.50	@37.00
	sales	@35.75	@36.25

After a general advance the previous month bean and meal prices leveled off and markets remained quiet throughout the month with a tendency to reach somewhat lower levels on the part of beans. Trading in oil continued under the ceiling.

CASH CONVERSION SCALE

1 Bushel Soybeans wt. 60 lbs..... 1.71 1/2

INTO

8.8 lbs. Crude Oil @ 11c..... .968

49.5 lbs. Meal @ 1.806c..... .893

1.862

Gross Processing Margin per Bu.....14.7c

Gross Processing Margin per Bu. Last Month.....12.675c

Note: This scale is based upon soybeans with average moisture content of 14 percent or less (No. 2 yellow beans). For beans of higher moisture content allowances for shrinkage must be made. The values listed here are relative, and cannot correspond with your own transactions. Using your own figures, you can compute your own scale. This scale will show general trends.

STANDARD SHORTENING SHIPMENTS

By Members of Institute of Shortening Mfgs., Inc.

Week ending July 11.....	9,649,311 lbs.
Week ending July 18.....	9,196,926 lbs.
Week ending July 25.....	9,848,337 lbs.
Week ending August 1.....	10,768,715 lbs.

HOW TO HANDLE RECORD CROPS

Prepare now for the coming flood of corn, soya beans, and other grain harvests. Enlarge storage facilities by building Neff & Fry concrete stave bins.



- Special high strength, interlocking, diagonally pointed staves.
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- Capacities and arrangements to your specification.

THE NEFF & FRY COMPANY
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NEFF & FRY STORAGE BINS

AUGUST, 1942



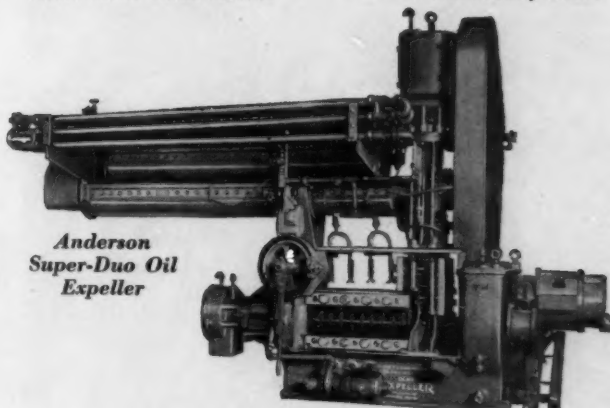
Men Who Know OIL MEAL PRODUCTION

WE DOUBT SINCERELY whether there is any other group of men in the country who know as much about the production of cottonseed, soy bean, copra, and other oil meals as do the Anderson Expeller Engineers. It's only logical that they should know more about this subject. They have traveled far and wide, called on hundreds of oil mills, have helped to install not only Expellers but other oil mill equipment, and have worked with oil mill superintendents on their production problems. We suggest that if you are going to build a new oil mill or enlarge your present facilities, you call in an Expeller Engineer. He will gladly give you the benefit of his experience and show you how to obtain economical production through selecting the best equipment and methods. There is no charge to you.

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NEW INDIANA VARIETIES

The Gibson and Patoka varieties are described in Circular No. 270, by G. H. Cutler and A. H. Probst, respectively Assistant Chief in Agronomy and Junior Agronomist, Division of Forage Crops and Diseases, Bureau of Plant, U. S. Department of Agriculture. The bulletin is issued by Purdue University Agricultural Experiment Station, Lafayette, Indiana.

TWO new varieties of soybeans, the Gibson and Patoka, are announced by Purdue University.

These new varieties were developed to fulfill the demand of growers in southern Indiana for yellow-seeded varieties which would have later maturity, not shrivel so badly and yield more than standard yellow varieties for that section.

The Gibson and Patoka are later-maturing than the available standard yellow-seeded varieties such as Dunfield, Illini, Manchu, Mandell and Richland, give higher yields of better quality grain, and are generally better adapted to this section, which grows over 200,000 acres of beans annually.

The Gibson is a selection from a cross between Dunfield and Midwest made by Cutler in 1930.

The plant is medium to tall in height usually about the same as Kingwa, with a semi-whip-like type of growth. It stands well, as a rule, until the seed is ripe and is suitable for combining. Rarely if ever do the seeds shatter when ripe. Gibson ripens in about 145 days. If soybeans are followed by winter wheat, the Gibson would be, on the average, entirely too late for safe wheat seeding as far north as Lafayette.

Patoka is a pure line selection from P. I. 70218-2, an introduction by the Division of Plant Exploration. The plant from which Patoka was derived was selected by Cutler from a field near Patoka, in southwest Indiana, in 1934.

The variety is medium tall, somewhat shorter than Kingwa, with quite an erect and somewhat bushy type of growth, is well suited for combining. Because of its high oil and protein content it is capable of serving admirably in a dual capacity in the production of both oil and protein.

Patoka ripens in 138 to 141 days in southern Indiana when seeded at the normal time. Since Patoka ripens in a shorter season than Gibson, it may be expected to extend its area of cultivation well into the south-central part of the state, even north of U. S. Highway 40.

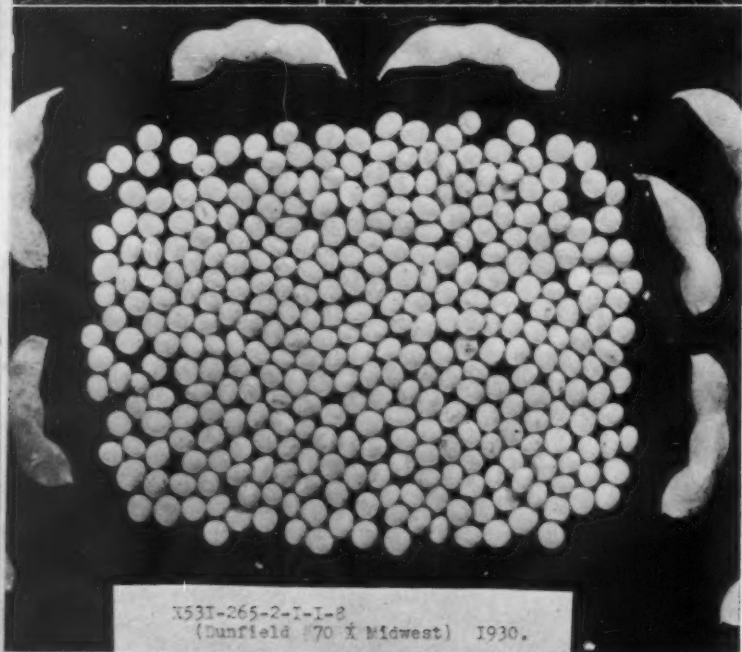
The Gibson and Patoka varieties are quite similar in yield and have outyielded Kingwa and the commercial yellow-seeded varieties in that area during the four-year period in which they have been compared.

The varieties are being multiplied under certification this year. About 1,000 bushels of seed have been distributed to certified seed growers and with a satisfactory harvest this fall the varieties should be extensively available for 1943 planting.

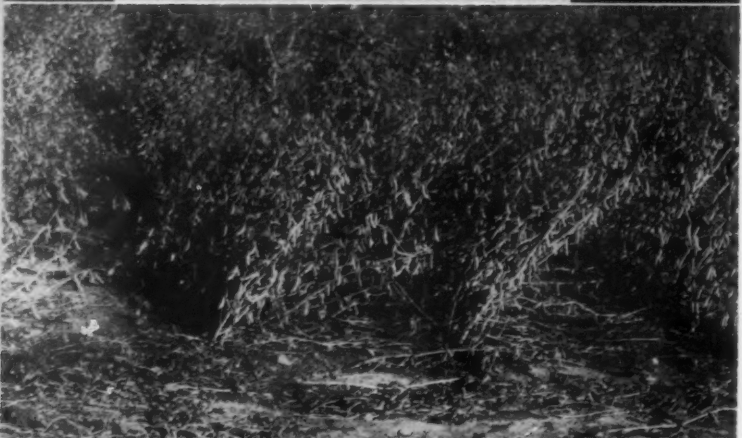
(Continued on page 11)

The two upper pictures are of the Gibson variety, showing pod formation, plant type and growth habit as well as pods and seeds. The two lower pictures show the same features of Patoka soybeans.

— Photos Purdue University



X53I-265-2-I-I-8
(Dunfield 70 x Midwest) 1930.



Come to "Headquarters" for **MOISTURE TESTING EQUIPMENT**

Here Are the Facts on Soybean Testing --- Read Carefully



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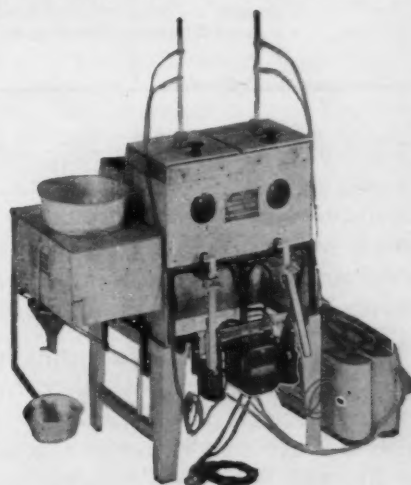
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Tentative Annual Convention Program

(Subject to additions and revisions)

All meetings at Purdue Union, Lafayette, Indiana unless otherwise specified.

TUESDAY, SEPTEMBER 15

8:00 p.m. Informal soybean Smoker, Purdue Union
Round Table Discussion
Board of Directors Meeting

WEDNESDAY, SEPTEMBER 16

8:30 a.m. Registration, Purdue Union
9:00 a.m. Annual Business Meeting, American Soybean Association
11:00 a.m. "Soybeans in the South"
11:30 a.m. "Soybeans as a Coffee Substitute"
12:30 p.m. Luncheon
"Soybean Research at the Northern Regional Laboratory," H. T. Herrick, Director
2:00 p.m. "Making the Public Protein Conscious," Dean H. J. Reed, Purdue University
2:30 p.m. "Soybean Oilmeal in Poultry Feeding," Professor C. W. Carrick, Purdue University
3:00 p.m. "A Message to Soybean Growers," H. A. Olendorf, Pres., Soy Flour Association
3:15 p.m. "Recent Work of the Bureau of Home Economics on the Use of Soybean Products as Food," Dr. Louise Stanley, Chief of Bureau of Home Economics, Department of Agriculture, Washington, D. C.

3:45 p.m. "Soybeans in the Lend-Lease Program," Donald S. Payne, Senior Technologist, Oil Seeds Branch, Livestock Section, Agricultural Marketing Administration

4:15 p.m. "Soybean Protein in Food Manufacture," A. A. Levinson, Soybean Division, The Glidden Company

4:45 p.m. Open Forum. A. M. Dickson, Leader.

7:00 p.m. Annual Banquet. "The Place of Soybeans in Advancing World Nutrition," M. L. Wilson, Chairman National Advisory Committee of Nutrition and Director of Division of Extension, U. S. Department of Agriculture
"Soybeans in the Army Diet," Colonel Rohland A. Isker, in Charge Subsistence Research Laboratory, United States Quartermaster Corps, Chicago

THURSDAY, SEPTEMBER 17

9:00 a.m. Field Trip. Soybean Experimental Work on Purdue University Farms

12:30 p.m. Luncheon. "The 1942 Governmental Price Program," C. C. Farrington, Chief, Commodity Credit Corporation, Washington

2:00 p.m. "Soybean Meal on the Farm"

2:30 p.m. Dr. W. J. Morse

3:00 p.m. "Soybeans From the Practical Farmer's Viewpoint," Prominent Indiana Soybean Grower

3:30 p.m. Adjournment.

TIME to put a big red circle on your calendar around the dates Sept. 15-16-17, if you have not already done so. Need we remind you that those are the dates of the American Soybean Association convention at Purdue University, Lafayette, Indiana?

In shaping up the program, your officers have been mindful of overwhelming new developments, responsibilities and opportunities that have come to the industry during the past year. We have been most fortunate in obtaining prominent leaders from the U. S. Army, the U. S. Department of Agriculture, from Purdue University and from industry as speakers. Headliners will be M. L. Wilson, director of extension work in the U. S. D. A., and C. C. Farrington, president of the Commodity Credit Corporation.

All sessions are open to the public. All soybean producers, handlers and processors are urgently invited to attend and participate in the discussions, which we

believe will be of major importance to the industry. Ample hotel facilities are being arranged. Rooms will be available at the Purdue Union, or at several hotels in Lafayette at reasonable rates. Registrations will be at the Purdue Union, where all programs except the field trips will be held.

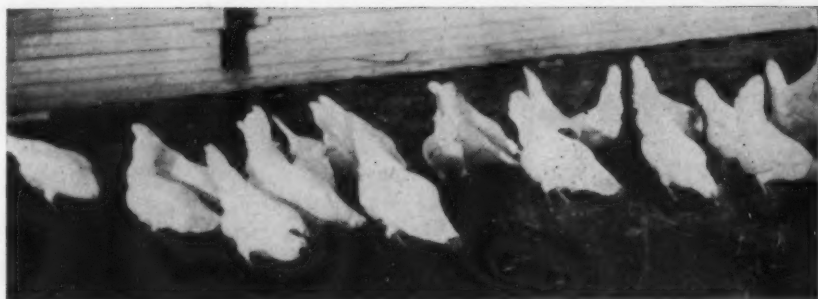
The convention will open with a pre-convention smoker at the Union Tuesday evening. The annual business meeting will be held at 9 a.m. Wednesday. The general subject to be covered Wednesday will be new wartime uses of soybeans with special emphasis this year on soybeans in the American diet.

As the University observes its annual Corn and Soybean Field Day Thursday, the big feature of the day will be a field trip through the University's experimental fields Thursday morning. This will be followed by a noon luncheon and a short afternoon program with final adjournment of the convention at 3:30 p.m.

Those in charge are trying to tie this year's convention in with wartime economy and needs. They are trying to give you a streamlined program and still allow plenty of time to devote to those subjects of most general interest.

Plan to be one of those in attendance at Purdue Sept. 15-16-17!

Listen to Soybean Digest Over KXEL 6:15 a. m. Each Thursday 1540 on Dial



"FEED MORE PROTEIN"



FEEDING



FEED PRICES FAVOR MEAL

At present prices for tankage and corn, hog producers will probably find it profitable to feed considerably more soybean oilmeal in their protein supplement mixtures to replace a part of the tankage, according to Carl Malone, farm management specialist at Iowa State College.

Only well-cooked soybean meal provides an adequate substitute for tankage in hog feeding, however, Malone states. Soybeans fed whole tend to produce soft pork, but this is not the case with soybean meal since most of the oil has been expressed or extracted.

In general, for various classes of livestock, at least 20 percent of the protein supplement should come from animal sources such as tankage or skimmilk. A number of experiments have been made which show that soybean meal compares quite favorably with tankage for hogs over 75 pounds.

For each 100 pounds of soybean meal fed about 30 to 35 pounds less corn is required when the ration is supplemented to the same level with tankage. Tankage is higher in mineral content and about 5 to 6 pounds more mineral is required per 100 pounds of supplement when soybean oilmeal is used.

On the average, 100 pounds of soybean meal is equal to 50 pounds of tankage, plus 31 pounds of corn, and minus 3 pounds of mineral mixture. For example, when the price of tankage is \$4 per 100 pounds and corn is 80 cents per bushel, soybean meal is worth \$2.35 per hundred pounds as a substitute for tankage.

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POULTRY PROTEINS

A problem brought about by the war is that of having enough high-quality protein in mixed feeds for poultry, Dr. Harry W. Titus of the Bureau of Animal In-

dustry, Washington, told the annual convention of the American Feed Manufacturers' Association at French Lick, Ind., recently.

Said Dr. Titus:

It is a rather difficult problem even now, but the indications are that it will become much more difficult in the near future. There is an adequate supply of sources of plant protein, but in general plant protein is not so good as animal protein.

The partial solution of our protein problem is soybean meal. When this product is properly prepared, that is, when it has been suitably cooked or toasted, it has a biological value comparable to that of meat scrap. Some investigators even claim that it is slightly better than meat scrap. When a given diet contains 6 percent or more of fish meal and 5 to 10 percent of meat scrap, cooked soybean meal can replace all the meat scrap, and the resulting diet, if it is otherwise properly balanced, will often be as good as the original and sometimes a little better.

Inasmuch as we most likely shall produce more soybean meal this year

DR. HARRY W. TITUS



—Courtesy Flour and Feed

than we have ever produced before, we should make every effort to use as much of it as possible in feed mixtures for poultry. A good way to increase the use of soybean meal in such feed mixtures is to use it to bring the protein content to the desired level after the minimum quantity of animal protein has been used.

The minimum quantity of animal protein ordinarily will be 20 percent of the total protein in the total diet. As sources of animal protein it still will be necessary to use such materials as meat scrap, fish meal — including crab meal and shrimp meal — dried skim milk, dried buttermilk, and dried whey.

In compounding feed mixtures that are to contain large quantities of soybean meal special care should be taken to include sufficient riboflavin, calcium, phosphorus, and salt, because soybean meal is not a particularly good source of these nutrients.

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KNIGHT DIES AT WASHINGTON

Dr. Henry K. Knight, who had been chief of the Bureau of Agricultural Chemistry and Engineering, U. S. Department of Agriculture, died of a heart attack in Washington July 13, at the age of 63.

Dr. Knight had been active in establishing the modern agricultural research centers such as the U. S. Regional Soybean Industrial Products Laboratory at Urbana. He was keenly interested in the industrial utilization of soybeans and soybean products, and contributed greatly to the development and prosecution of the research program in this field.

— s b d —

SOY HEARING AT ST. LOUIS

The U. S. Department of Agriculture has announced a public hearing for the week beginning August 24 to consider comparable prices under the emergency price control act for a number of agricultural commodities including soybeans.

The hearing will be held at the Roosevelt Hotel in St. Louis, Mo. Date set for soybeans, peanuts for oil, tung nuts and several vegetables for processing is August 26.

The purpose of this hearing will be to hear testimony with respect to whether the production and consumption of the various commodities have so changed during the last 20 to 30 years as to result in a price out of line with parity prices for the basic crops, corn, wheat, cotton, rice, tobacco, and peanuts for nuts.



Horace T. Herrick, Director, Northern Regional Research Laboratory, examining plastic articles made from soybeans. Dr. Herrick, who recently succeeded Dr. Orville E. May as Director of the Laboratory, in this article tells of the changes that have taken place at Urbana and Peoria.

THE PRESIDENT of the United States signed the 1942 agricultural appropriations bill on July 23, transferring a part of the U. S. Regional Soybean Industrial Products Laboratory from Urbana, Illinois, to the Northern Regional Research Laboratory at Peoria.

This transfer brings the full chemical and engineering research staff of the Soybean Laboratory to the Northern Regional Research Laboratory where it will work in one of the most modern chemical laboratories and where it will have facilities for pilot-plant experiments, mechanical shops, and glassblower at its disposal. The chemical analytical work connected with the agronomic phases in the development of improved strains and varieties of soybeans remains in Ur-

Soybean Research at The Peoria Laboratory

By H. T. HERRICK
Director Northern Regional Research Laboratory[§]
Peoria, Illinois

bana where it will continue its comprehensive program under the Bureau of Plant Industry.

The chemical research program of the Soybean Laboratory prior to its transfer to Peoria consisted of investigations on methods for purifying and characterizing soybean proteins, development work on the use of soybeans in plastics, adhesives, coatings, and fibers, work on methods for improving the stability of edible soybean oil, and research on refining and chemically modifying soybean oil and its derivatives as a means of increasing its industrial utilization. This chemical research was supplemented by related engineering investigations on expeller and extraction processing the beans and selective-solvent extraction techniques for fractionating the oil as well as on the physical conditions that influence the efficiency of the various processes involved in producing and modifying soybean products.

To Include Soybeans

The program of the Oil and Protein Division of the Northern Regional Research Laboratory up to the present time has covered research on the isomerization, polymerization, and sulfurization of corn and wheat oils and their derivatives, and industrial application of such investigations to the production of rubber-like materials, drying oils, resins, and plastics from these oils. As the result of the

recent Congressional Act, merging part of the Soybean Laboratory with the Northern Regional Research Laboratory, thus making soybeans a research commodity of the latter, the oil and protein program of the Peoria laboratory, previously limited to corn and wheat oils and corn proteins, is now being expanded to include the oil and proteins of soybeans and their derivatives. Since the Northern Regional Research Laboratory already has a group of ten chemists engaged in fundamental research on the chemistry of corn and wheat oils and corn protein, and since the chemistry of these materials is closely related to that of soybean oil and protein, the transfer of the Soybean work to Peoria will lead to greater concentration of research on the soybean research program of the Department of Agriculture.

Rubber Substitute

The potentialities of chemical research on such farm commodities as corn and soybeans are well illustrated by the Northern Regional Research Laboratory's recent develop-

[§]The Northern Regional Research Laboratory is one of four regional laboratories authorized by Congress in the Agricultural Adjustment Act of 1938 for the purpose of conducting research to develop new uses and outlets for agricultural commodities. These laboratories are administered by the Bureau of Agricultural Chemistry and Engineering of the U. S. Department of Agriculture.

The Northern Regional Research Laboratory at Peoria, where research now will be done on soybean products, in addition to corn and wheat.



ment of a rubber-like material which has tentatively been given the name "Norepol." This material, an elastic vulcanizable polymer originally made from corn oil was described in the July, 1942 issue of "The Soybean Digest." This work was started as a study of organic chemical functionality in corn oil and its derivatives in relation to the strength and elasticity of the commercial sulfurized corn oil rubber extenders or "factices." However, as the work progressed, it led further and further away from the factice type of rubber extenders and closer to a product having the properties of rubber. As the work continued, it became evident that the new material might have sufficient strength and elasticity to be used as a rubber substitute for special purposes in our war program. It likewise became evident that some other oil, as well as corn oil, would have to be used as the organic raw material. Fortunately the chemical constitutions of soybean and corn oils are strikingly similar, so cooperative work between the Northern Regional Research Laboratory and the U. S. Regional Soybean Industrial Products Laboratory was begun several months ago. As the result of this work the new elastic, vulcanizable polymer, Norepol, is now being successfully produced on a pilot-plant scale from soybean oil. If the industrial tests now in progress are successful, this bit of "theoretical" research may have a far reaching effect.

This single example is typical of the results that may come from any well-planned research program. It is illustrative of the kind of dividends which the Soybean Laboratory at Urbana and the Northern Regional Research Laboratory at Peoria have already paid in other fields, and is indicative of the kind of results we may expect from the soybean program in its new home in Peoria.

— b d —

SOY OIL STOCKS AND CONSUMPTION

Factory production of crude, soybean oil during the quarter ending June 30 totaled 167,945,000 pounds as compared with 141,180,000 for the same quarter last year, according to report of the Department of Commerce. Production of refined oil for the period was 147,269,000 pounds, compared to 126,301,000 a year ago. Consumption of the crude and refined oil for the three months was 164,880,000 and 123,400,000 pounds respectively.

During the same period factory and warehouse stocks of crude soybean oil totaled 78,719,000 pounds, of refined oil, 76,098,000. This compares with 34,823,000, and 40,606,000 for the corresponding three months last year.

PERSONALITIES



AUTHOR BROMFIELD

A NOVELIST GROWS BEANS Louis Bromfield, one of the country's best known novelists, whose most recent book, "Until the Day Break," has just been issued by Harper's, is a soybean farmer at Lucas, Ohio.

Bromfield lived and wrote in France for 15 years. He and his family came back to America when "the lunatics began emerging and this terrible thing we are now in the midst of became inevitable."

The day he got off the boat he bought the first of his three farms, "a poor run-down farm in the hills of Richland County." He says he would have been bored with a good farm.

Bromfield believes that such objectives as soil conservation and diversified farming must become the farm program of the future. This is the program he practices on his thousand acres of Ohio farm land. He has turned part of his land back into pasture and has planted cover crops on his top fields. He never has a vacant field. Proper moisture conservation has brought back springs to the farms that had dried up long ago, and produces 30 to 40 percent larger crops than "good old-fashioned" farming.

Concerning his soybean production, which fits into this conservation pattern, Mr. Bromfield writes: "We raise a considerable quantity every year for various purposes — a large amount of hay beans for feeding sheep and beef cattle, several hundred bushels for certified seed, and keep a number for feeding and protein supplement to various animals. Also we fill the silos with a mixture of corn and soybeans which makes excellent silage, and sow beans with the Sudan Grass for our supplementary summer pasturage. In addition to this we raise edible varieties in our vegetable garden. So you see, the soybean plays a large part in our farm existence."



RESEARCH



BULLETIN ON PLASTICS Plastics of high impact strength and low water absorption can be produced from low-cost agricultural products and by-products. Such are the conclusions of Doctors Sweeney and Arnold in Bulletin 154 of the Iowa Engineering Experiment Station, "Plastics from Agricultural Materials."

Four plastic products have been studied, all of which show definite commercial possibilities. In general, these products could be substituted at a low cost for phenolic plastics in brown, black, and possibly dark red colors. They compare favorably with phenolic plastics in strength, appearance and water resistance.

Extracted soybean meal, furfural, phenol and ammonium hydroxide were heated together to form a resin

which was mixed with hexamethylenetetramine and either wood flour or asbestos filler, and molded into a plastic of excellent strength and appearance.

The bulletin reports in detail the effect of varying the raw material combinations, molding conditions, time and temperature of cooking, and other procedures, together with specific recipes for the plastics judged best after many years of study and experimentation. The optimum proportions of ingredients and the optimum cooking conditions were established. The reactions of phenol and sulfuric acid with the individual corn cob constituents are discussed in considerable detail.

Single copies of this 52-page bulletin may be obtained without charge from the Iowa Engineering Experiment Station, Iowa State College, Ames, Iowa.

SOYBEAN MOISTURE CONTENT

New Official Method of Determining

By **ROBERT H. BLACK**
In Charge, Grain Standards Research

PROCEDURE for the inspection and grading of soybeans includes a test for moisture content. The official basic method and alternate methods permitted for making the moisture tests are specified in the United States standards for soybeans. Although moisture tests are made by grain inspectors and grain supervisors according to methods that have been established in accordance with the requirements of the U. S. Grain Standards Act, tests by others have been made frequently by using methods and equipment that produced inaccurate results.

The basic official method for determining the moisture content of soybeans includes heating the material

to be tested in an appropriate oven. The loss in weight that occurs during the heating process is considered to be the moisture content of the material, and this loss in weight or moisture content is recorded as the percentage of moisture in the original material before drying.

Typical samples of soybeans that contained 14 percent of moisture as determined by the official method have been found to contain approximately 18 percent of oil, 40 percent of protein, 5 percent of ash, 5 percent of crude fiber, and 18 percent of other materials, principally carbohydrates.

Several different methods of determining the moisture content of soybeans have been used. Part of the water in soybeans is tightly held by the proteins and because the carbohydrates as well as the oil and proteins may be lessened in weight by the application of too much heat for too long a time, large variations have occurred in the results obtained by testing soybeans for moisture by the different methods.

Cause of Variation

One important cause of variation in the apparent moisture content of soybeans as determined by different drying methods is attributed to the so-called "bound water" content of the product. In most biological material some of the moisture is tightly held ("bound") by powerful physical forces to certain constituents, principally proteins, without actually becoming a part of these constituents. This bound water is much more difficult to remove from the product by drying processes than is "free" water. Thus the more drastic the drying process, the greater the reported moisture content of the sample. Unfortunately, it is impossible in most cases to remove all of this bound water without resorting to a treatment drastic enough to cause decomposition of carbohydrates or other substances with a resulting loss of weight.

The carbohydrates also cause difficulty in determining the moisture content of soybeans. Carbohydrates are composed of varying amounts of carbon, hydrogen, and oxygen. Carbohydrates vary greatly as to their stability when heated, but most of them liberate hydrogen and oxygen in the form of water which is immediately evaporated. If too high a temperature is used, not only are the free water and bound water evaporated, but hydrogen and oxygen are also released from the carbohydrates

in the form of water with the result that a too high, false moisture is calculated for the material being tested.

For these reasons it has been necessary to adopt an arbitrary or empirical method as the official method for the determination of moisture in soybeans.

Brown-Duvel Tester

The Brown-Duvel moisture tester was the basic method and the method most commonly used for determining the moisture content of soybeans prior to 1935. The Brown-Duvel method employs a distillation process. The soybeans are placed in a flask containing oil and are boiled. The evaporated water passes through a cooling tube and is condensed to water that falls into a graduate so marked as to permit reading the moisture results in percentage figures.


(Continued on page 9)



— Courtesy Seedburo Co.


Users of Steinlite or Tag-Heppenstall moisture testers pictured above will need a new conversion chart after the new government grading standards go into effect in September. This can be obtained by writing to manufacturer and giving him serial number of tester. Users of the Brown-Duvel equipment shown below will find it necessary to shut off the heat at 173 degrees instead of 170.

ALL OUT FOR VICTORY



WITH DANNEN'S SOYBEAN OIL MEAL

Uncle Sam needs soybean oil and American farmers are raising more soybeans to furnish this oil. That means more DANNEN'S SOYBEAN OIL MEAL will be available for production of more meat, milk, and eggs. You can cooperate by using DANNEN'S SOYBEAN OIL MEAL (expeller type) in your feed rations.



For LIVESTOCK AND POULTRY

DANNEN
GRAIN & MILLING CO.
ST. JOSEPH, MO.

SOYBEANS

and People . . .

GOING to can or freeze vegetable soys this fall? Either method of preserving can be successful.

Time to pick for processing or freezing is when pods are from three-fourths full to full, before they begin to turn yellow. Most varieties remain in this edible stage 10 days, some twice that long.

Beans should be handled quickly after picking — within an hour or two — either for freezing or canning, as they begin to lose some of their sugar — and with it their flavor — almost immediately.

As stated last month, the labor of shelling out the pods is the stumbling block in the handling of green soys. Iowa Experiment Station, by covering the pods with boiling water and boiling for 5 minutes, cut shelling time of 1½ pounds of pods from 2 hours to 20 minutes. (At Illinois they pour the boiling water over the pods and allow to stand for 5 minutes.) The recommended method of shelling is to hold the pod between thumbs and forefingers with the longer side up, snap in two cross-wise and squeeze the beans out of each half. Another method is to hold pod between thumb and forefingers and squeeze out the beans, by bursting the pod open. The average yield is about ½ pound of shelled beans from a pound in the pod.

Pre-Cook for Freezing

Freezing is more successful than canning in retaining flavor and color, the University of Illinois finds.

The station recommends pre-cooking the beans in boiling water for ½ minute after shelling. This stops enzyme action and deterioration in flavor and color during storage. The pre-cooked beans are plunged into cold water to cool quickly, then drained and packed in tight containers. If they are not frozen within a few hours after picking they may lose much of their natural sweetness before they enter the freezer.

When beans are taken out of storage, they are plunged, still-frozen, into boiling water and cooked, with

the addition of salt. If allowed to thaw first, they should be cooked as soon as the ice has disappeared.

Nutritionists at the Iowa station found in canning that the addition of ½ to 1 teaspoonful of sugar to 1 teaspoon of salt per pint improved the taste. But maybe one shouldn't mention that this year!

They have found both water bath with a tight lid and pressure cooker methods of canning successful with the green soys. Processing time is similar to that required for green peas. Pints heated in the water bath much less than 3 hours resulted in considerable spoilage; 3½ hours, none. The time recommended for pressure cooker is 60 minutes at 10 pounds pressure, or 80 minutes for mature beans.

No Need for Bossy

If you wish to make your own butter, milk and cheese, here are some recipes to help you, from the Edison Institute, Dearborn Mich.:

SOY BEAN MILK

Soak one pound of beans in water for 6 to 8 hours and discard the water. Wash the beans with water several times, grind the moist bean as fine as possible, using water to assist. Add water to make the mixture measure 1 gallon, and strain. The strained liquid is heated to about the boiling point, preferably in a double boiler, for 15 to 30 minutes, sugar and salt are added to taste.

SOY BEAN CHEESE

Proceed as in making milk to the point of heating the strained liquid. The strained liquid is heated to about 190° F., but not to the boiling point. At this temperature dilute acetic acid or vinegar is added to just complete coagulation. This is strained out and washed free from acid. Salt to taste. This cheese is rather insipid in taste but is used in making croquettes, salads, sandwich spreads and other products.

SOY BEAN BUTTER

Grind about 2½ cups of roasted soy beans and mix with about 2 tbsp. of purified soy oil or Wesson oil.

— s b d —

MOISTURE CONTENT

(Continued from page 8)

In 1935 the water-oven method was established as being the official basic method for the determination of the moisture content of soybeans, but the use of the Brown-Duvel moisture tester and any other device that gave equivalent results was permitted.



— From Farm Science Reporter

Beans should be precooked before placing in freezer.

The water-oven method employs an oven having a water jacket in which the water is kept boiling for 96 hours. The whole soybeans are placed in a compartment inside the water jacket and the amount of weight lost in this drying process has been considered to be the official percentage of moisture in the soybeans.

During 1941 and the early months of 1942, a thorough survey was made of the methods used by soybean manufacturers in processing soybeans. This was done in an attempt to develop an official moisture testing method that would give results equivalent to results obtained in the processing industries and that would be equitable to the producers and processors.

As a result of this survey, the air-oven method will become the official basic method on and after September 1, 1942 for determining the moisture content of soybeans that are inspected and graded under the U. S. Grain Standards Act. In the air-oven method, the ground soybeans are dried for one hour in a ventilated oven at a temperature of 130° C.

The air-oven method will be the official basic method but in the inspection and grading of soybeans the inspectors may use alternate methods that give equivalent results and that permit the moisture tests to be made promptly and at small cost. New conversion charts have been made for use with the electric moisture testers that are commonly used by grain inspectors and the soybean trade, and revised instructions have been issued to be applied when the Brown-Duvel moisture tester is used.

August Condition Generally Good

APPROXIMATELY 10.4 million acres of soybeans will be harvested for beans this year, according to present estimates of the U. S. Department of Agriculture. This compares with the 9 million acre goal set earlier. The production outlook is about 63 million bushels compared with 49 million produced in 1941.

Our August 1 reports from DIGEST correspondents:

ILLINOIS

J. E. Johnson, Champaign, for east central: Crop behind at least 10 days due to very late planting. Early seedings look best ever, late seedings small. Many weedy fields growing worse as season advances. Many light stands. Too early to make predictions on what percentage will mature before normal frost. Should be none cut for hay with present price of beans.

Russell S. Davis, Clayton, for western: Crop 2 weeks late. Midseason varieties just now in full bloom. Beans should be ripe before average killing frost date of Oct. 18. Very few seeded with intention of cutting for hay. Rather a large portion of the acreage on flat and bottom lands did not get seeded. Rowed beans look promising. Drilled solid fields are pain. More weeds and grass than beans.

A. J. Sarraff, senior agricultural statistician, Springfield: Condition has been improving during past two weeks. Prospects for upper east central and northern sections range from average to excellent, in contrast to unevenly good to poor conditions, with many fields very weedy, in southern half of state where there was additional abandonment in July due to flooding of grass and weeds.

J. C. Hackleman, extension agronomist, Urbana: In east central and southeastern Illinois, 75 percent maturing close to normal, 25 percent a week late. Weather conditions during past month ideal. Probably 75 to 85 percent will mature before normal frost date, with 15 to 20 percent being cut for hay.

IOWA

Howard L. Roach, Plainfield, for northeast: Crop maturity and condition normal, with probably 80 percent to mature before normal frost date. Estimated 20 percent to be cut for hay.

Charles R. Weber, U. S. D. A. Bureau Plant Industry, Ames: Because of plentiful moisture conditions, beans are making greater vegetative development than normally. Beans are large enough so excessive moisture is not now hindering growth. If rains continue throughout summer and early fall, there will likely be lagging in normal ripening date.

Leslie M. Carl, Federal Statistician, Des Moines: 1942 soybean acreage estimated at 2,241,000. Preliminary estimates indicate 1,882,000 acres harvested for beans and yield per acre is placed at 21.0 bushels. This gives tentative production total of 39,522,000 bushels, nearly 240 percent of last year.

INDIANA

K. E. Beeson, extension agronomist, Lafayette: Crop maturity normal. Much late planting although probably not much higher percentage than for several years. It is expected that the 47 percent increase in acreage will be harvested for seed.

J. B. Edmondson, Clayton, for south central: Crop slightly behind time but gaining. Plants

tall and blossoming heavily. With normal fall moisture, 90-92 percent of crop should mature. Six percent to be cut for hay. Practically all new growers will combine. Weeds just now beginning to peep through above beans. These will be chiefly a nuisance factor in harvesting. Never a finer prospect for beans.

Ersel Walley, Walley Agricultural Service, Fort Wayne, for northwestern Ohio and north-eastern Indiana: Crop about 5 days late, but all should mature before frost. Very little to be cut for hay.

OHIO

G. G. McIlroy, Irwin, for central: Crop maturity and condition normal, with estimated 80 percent to mature before frost. Few beans to be cut for hay. Prospects fine but rain badly needed. With only 1.44 inches rain in July we are in critical situation for both beans and corn.

D. F. Beard, extension agronomist, Columbus: Crop on the average 1 week to 10 days late. Dry spots in state but overall condition good. If conditions favorable most beans for grain harvest will mature o. k. About 250,000 acres of 1,403,000 will be cut for hay.

W. G. Weigle, Van Wert, for northwest: Average one week late. Many beans very small where planted late, with estimated 80 percent to mature before frost. Very little will be cut for hay.

David G. Wing, Mechanicsburg, Ohio, for central: Crop maturity normal. We have had good rains. The beans are still growing and most of them are wonderful to look at. They are so tall that they are falling down.

WISCONSIN

George M. Briggs, University of Wisconsin, Madison: Crop 75 to 100 percent of normal, with about 80 percent expected to be matured before frost. Not much to be cut.

John P. Dries, Saukville, for southeastern: Crop 2 to 3 weeks late with present weather favorable and growth very rapid. Greatest part of crop along shore of Lake Michigan will mature, with none cut for hay. Seed crops show weedy condition. Many new growers planted on not too fertile ground not well prepared, so poor germination curtailed normal stands. Very few beans planted in rows.

MISSOURI

J. Ross Fleetwood, extension specialist field crops, Columbia: Crop about normal except late in flood areas. About 90 percent will mature before frost, with 300,000 out of a total of 800,000 acres cut for hay. Intended plantings were decreased materially by wet weather.

K. E. Soder, Agricultural Agent R. I. Lines, Kansas City, for eastern Kansas, Nebraska and western Missouri: Wide variation in crop but generally 10 days behind. Most will mature before normal frost date, with 10 to 15 percent cut for hay, the lowest in history.

KANSAS

E. A. Cleavinger, extension specialist, Manhattan: Crop maturity 40 to 100 percent normal. About 80 percent will mature before frost. Ten percent, 15,000 to 20,000 acres, will be cut for hay.

PENNSYLVANIA

E. L. Gasteiger, senior agricultural statistician, Harrisburg: Crop maturity is early with August 1 condition much better than average. All should mature before normal frost date and 51 percent will be cut for hay.

NEBRASKA

Kenneth M. Reed, county extension agent, Beatrice, for Gage and surrounding counties: Crop normal with about 80 percent to mature before normal frost date. Late sowing on ground flooded early, about 20 percent, may be cut for hay, though if possible growers will harvest for grain.

MINNESOTA

Farmers Seed & Nursery Co., Faribault, for southern half: Crop 1 to 2 weeks late, with perhaps 50 to 75 percent to mature before normal frost date. Perhaps more than intended 10 to 15 percent may be cut for hay because late planting will not mature seed.

W. G. Green, Lakefield, for southwest: Crop very spotted. Perhaps 60 percent will mature before frost. Generally the crop looks good. The amount to be harvested depends on frost.

MISSISSIPPI

J. M. Weeks, extension agronomist, State College: Crop 1 week late now, expected to mature about normal. About 50 percent of all beans grown alone to be cut for hay.

P. W. Gull, agronomist, Stoneville, for Yazoo Mississippi Delta: Crop normal. All should mature with about 15 percent to be cut for hay.

NORTH CAROLINA

H. W. Taylor, extension economist in marketing, Raleigh: Crop in eastern section of soybean belt below normal because of extended dry weather, but if rain falls within two weeks should be normal, and under this condition amount cut for hay should be average.

SOUTH CAROLINA

H. A. Woodle, extension agronomist, Clemson: Crop condition 95 percent, practically all will mature with 70 percent cut for hay. The 12,000 to 15,000 acres which we harvest for seed, scarcely gives us sufficient planting seed.

MARYLAND

Albin O. Kuhn, assistant extension agronomist, College Park: Soybeans have made excellent growth throughout the season, with about 90 percent to mature before normal frost date. About 55 percent will be cut for hay, as compared with usual 70 percent.

CONNECTICUT

J. S. Owens, University of Connecticut, Storrs: Crop is average. Almost 100 percent will mature before normal frost. Practically all cut for hay.

ARKANSAS

Jacob Hartz, Stuttgart, for rice section: Crop about normal, except for quite a few late planted beans, with too much dry weather. All will mature before normal frost. Very little cut for hay.

WEST VIRGINIA

R. J. Friant, extension agronomist, Morgantown: Crop 10 days late, with all to mature before normal frost. 95 percent for hay.

VIRGINIA

W. H. Byrne, agronomist, Blacksburg: Crop about normal. Practically all should mature before frost, and about normal amount hay.

KENTUCKY

E. J. Kinney, agronomist, Lexington: Crop about normal, with practically all to mature before frost. Very little cut for hay as other hay quite abundant this year.

NEW JERSEY

H. R. Cox, extension agronomist, New Brunswick: Crop looks better than average, with very high percentage to mature before frost. About half cut for hay.

NEW VARIETIES

(Continued from page 2)

A Comparison of Yield, Days to Maturity, Seeds per Pound, and Chemical Analyses of the Seed of Gibson and Patoka Soybeans with Several Other Varieties and Strains Grown in Southwestern Indiana

Variety or Strain	Av. Yields Bu. per Acre Southwestern Ind. 1938-1941	Average Days to Maturity*	Seeds per Pound	Comparative Chemical Analyses [§] (Moisture free basis)		
				Oil %	Protein %	Iodine Number
Kingwa	23.2	141	4,250	16.8	40.8	132.1
P.I. 54563-3.....	23.9	147	3,350	21.0	36.8	125.2
P.I. 70218-2.....	25.8	140	2,800	20.5	39.4	129.4
Macoupin	20.3	143	3,050	20.0	39.2	128.0
Patoka	26.6	140	2,750	20.1	43.9	130.4
Gibson	26.4	145	3,250	20.5	40.3	130.2

*The average planting date was May 14.

§Chemical analyses were made by the U. S. Regional Soybean Industrial

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NEW HIGH IN BEAN TRADING

Futures trading in soybeans, which felt the stimulating effect of sharply rising prices during the earlier part of the fiscal year, increased to the all-time high of 681,656,000 bushels, an increase of 11.5 percent over 1940-41, according to a report of the U. S. Department of Agriculture. Since last winter, however, the turnover in this commodity has declined markedly, influenced apparently by the ceiling price on soybean oil.

Trading in soybean meal showed a sharper increase in the fiscal year just closed, with a total of 623,000 tons. This is a 72.5 percent increase over the 361,200 tons of the 1940-41 period.

Futures trading in the fats and oils group which reached high levels in the previous fiscal year, dropped sharply under the influence of price ceilings during 1941-42, however. The report shows 4,800,000 pounds of soybean oil bought in the futures markets in 1940-41, none in the year just closed.

MORE SOYBEAN INSPECTIONS

Soybean inspections, with a total of 2,544 cars, increased sharply in June the Department of Agriculture reports. This compares with 1,387 cars inspected in May and with 2,177 cars in June 1941. The June inspections brought this season's total since October 1 to 41,700 cars.

During the period June 16-30 there were 1,297 inspections as follows: Illinois 775, Indiana 191, Iowa 54, Missouri 15, and Ohio 262.

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DANNEN BUYS REPLOGLE MILL

Dannen Grain & Milling Co., St. Joseph, Mo., purchased the mill and elevator property at Red Oak, Iowa, formerly owned by the Replogle Milling Co., from the Houghton State Bank, July 9. The purchasing firm has reconditioned the 100,000-bushel elevator and plans to repair the milling machinery so that flour can be milled if found feasible in the future.

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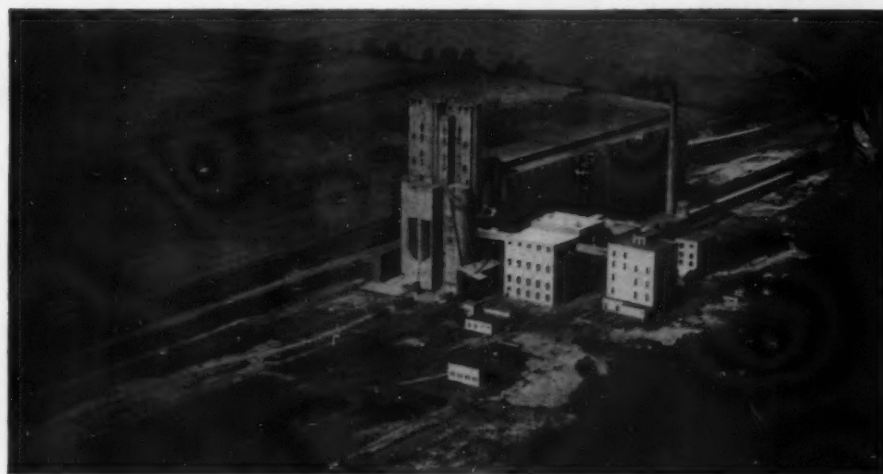
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SOYBEAN STOCKS

First Report
From B. A. E.

THIS month the DIGEST is enabled to carry the first report from the Bureau of Agricultural Economics on stocks of beans on farms, in storage at elevators and warehouses and at processing mills. This is in answer to the demands of the soybean industry for regular accurate reports of the nation's soybean stocks, and to the need of the U. S. Department of Agriculture itself for information in its production and supply programs under the war effort.

Funds have been allotted to the Bureau for the next six months to provide for the collection and publication of certain additional statistical information on soybeans, which will relate primarily to stocks of soybeans on farms and in country storages off farms. Other reports will follow during the fall months.

Farm Stocks

Stocks of soybeans on farms July 1 in the five principal soybean producing States are estimated at 7,565,000 bushels by the Crop Reporting Board of the United States Department of Agriculture. This is 7.9 per-

cent of the soybeans harvested last year in these 5 states — Ohio, Indiana, Illinois, Iowa, and Missouri. This is not complete coverage of the soybeans remaining on farms on July 1 this year, but it represents the farm stocks in the area of greatest concentration of production, since these 5 states last year produced 95,581,000 bushels, or 90 percent of the soybeans harvested in the United States. Although a rather large percentage of 1941 crop beans remained on farms in Missouri on July 1, a good many of these beans had been harvested late after considerable weather damage, some remaining in the fields until this spring before being harvested. The quality of many of the beans still on farms in Missouri is poor, some of them fit only for feeding to livestock.

Soybeans in storage in country elevators and warehouses in 6 important states July 1 were estimated by the Crop Reporting Board at 1,932,000 bushels. This figure includes such stocks in Ohio, Indiana, Illinois, Iowa, Missouri, and Minnesota. These 6 states reported 96 percent of

the soybean stocks enumerated in country elevators and warehouses in a nationwide survey of grain storage capacity and stocks, made on February 16.

At Processing Mills

In addition to soybeans remaining on farms, and in storage in country elevators and warehouses stocks in commercial storage at terminal markets as reported to the Grain and Seed Branch of the Agricultural Marketing Administration were 1,131,000 bushels on July 1. Stocks of soybeans in storage at all mills engaged in crushing soybeans were reported as 11,624,000 bushels on July 1 by the United States Department of Commerce, Bureau of the Census.

Stocks of soybeans in the four positions totaled 22,252,000 bushels on July 1, 1942. Allowing for stocks on farms and in country elevators and warehouses in states not covered by the surveys, total soybean stocks for the entire United States on July 1 are estimated at approximately 23 million bushels which is equivalent to about one-fifth of the 1941 production.



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Our Workers,
Our Armies
and
Our Allies*

THE call is to put every possible ounce of gain on every chick, every hog, and every steer this year. This means more liberal feeding of protein supplements than ever before.

Quality of protein is of first importance in feeding animals such as hogs and poultry, with a simple digestive system. For this feeders have relied primarily on animal proteins — fish meal, meat scraps, and milk. But soon we may be faced with a virtual famine of these items. Fortunately, there will be available an ample supply of the best of all animal protein substitutes — soybean oilmeal.

Soybean oilmeal compares favorably with tankage for hogs over 75 pounds, says Carl Malone, farm management specialist at Iowa State College. He recommends a protein supplement of 20 percent tankage, 80 percent soybean meal. And Dr. R. M. Bethke of the Ohio Experiment Station, says bean meal can safely replace at least 80 percent of animal protein in the poultry ration.

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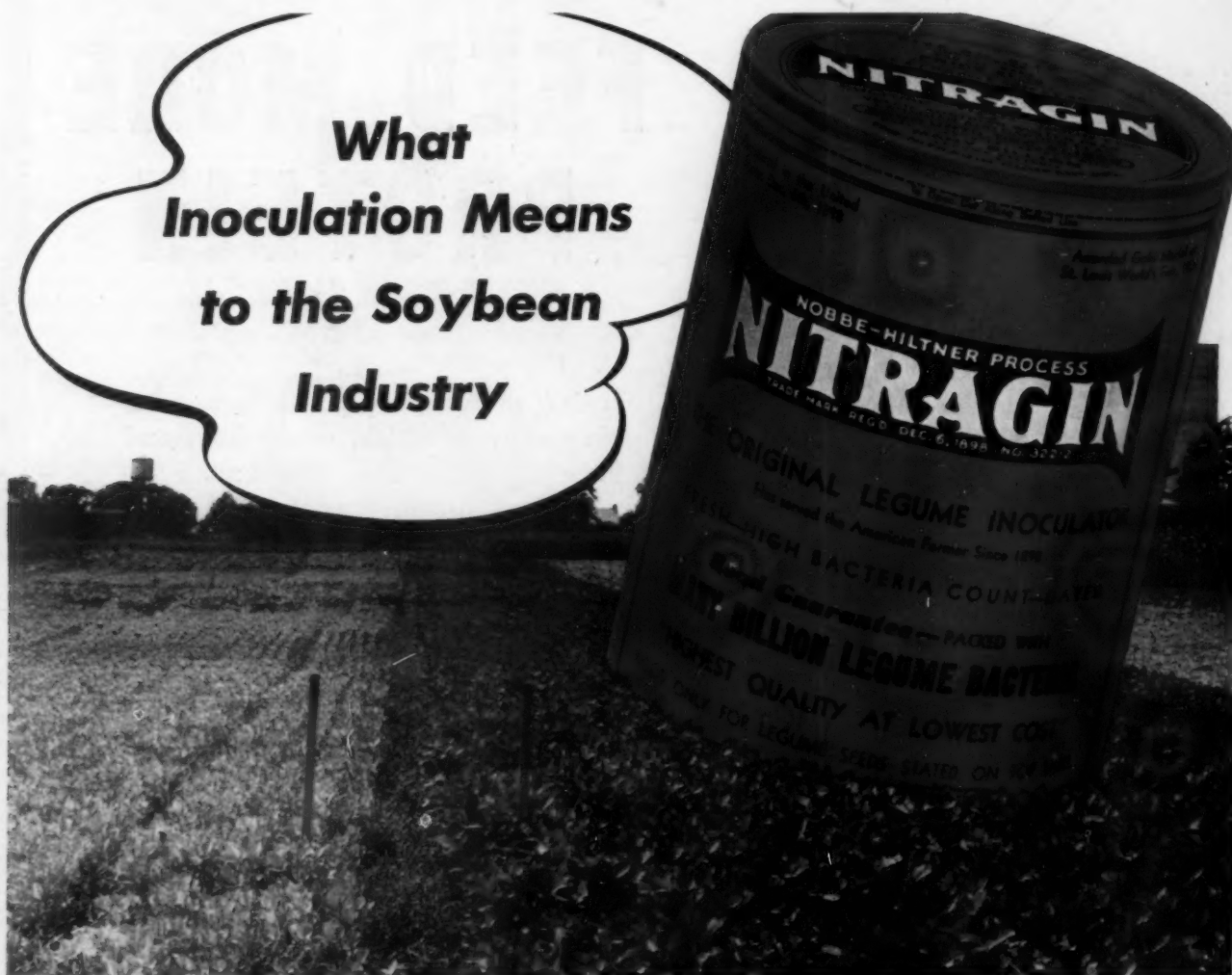
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What Inoculation Means to the Soybean Industry



▲ In this test conducted by an Eastern Experiment station, uninoculated soybeans, at the left, starved for nitrogen... finally were crowded out by grass and weeds.

▲ The soybeans at the right, inoculated with NITRAGIN, grew fast and vigorously to make a good yield. Note the heavier growth and darker green color.

Soybeans yield more than oil, protein and plastics; they harvest precious nitrogen from the air. Nitrogen is a key element in our war production program. It is the most vital element needed to step up plant growth and increase crop production. Nitrogen increases the protein content of plants, too. What nitrogen is to the growth of plants—protein is to the growth of livestock. The meat, milk, cheese and eggs needed by our soldiers and our allies, yes, even their clothing and shoes are mainly protein. Since nitrates used in commercial fertilizers are in tremendous demand for the manufacture of wartime explosives, every

farmer should be tapping the tremendous supply of free nitrogen in the air through the inoculation of legumes. Four-fifths of the air is nitrogen. It is there for the taking by legumes—soybeans, alfalfa, clovers, vetch, etc. Legumes are the *only* plants that can take free nitrogen out of the air, but they must be inoculated with the proper strains of nitrogen-fixing bacteria. NITRAGIN contains only selected, effective strains of bacteria whose quality is guarded by trained scientists working in the largest laboratory of its kind in the world. NITRAGIN is the oldest, most widely used inoculant . . . used for over 42 years.

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